REMARKS

The claims and drawings have been amended so as to overcome the Examiner's objections under 35 U.S.C. 112, second paragraph, and 37 CFR 1.83(a) respectively.

No new matter has been added to the drawings, detailed description, or claims. In particular, the detailed description as filed states:

> The operator can choose a desired laser pulse width by computer control. The computer is preprogrammed using a look-up table to provide the correct Q-switch storage time for the desired laser pulse width. The computer also provides the correct timing signal for the AOM deflector

Thus, a processor (the computer), by providing the correct Q-switch storage time for Q-switch 20 (FIGS. 1 and 2), presets or selects the pulse shape, as well as the time interval between pulses, and causes the laser system to be pulsed. By providing the correct timing signal for AOM deflector 26 (FIGS. 1 and 2), the processor ensures that the pre-selected pulse shape remains as preset regardless of the time interval, or that the pre-selected time interval remains as preset regardless of the pulse shape.

The Examiner's statement of reasons for allowance in the previous notice of allowance stated that the pulse width is varied by changing the energy storage time on the laser rod, whereby unwanted energy is removed with an external acousto-optic modulator. While this is the technique described in the specification that permits the claimed invention to be carried out, it should be understood, of course, that the independent claims do not include this specific recitation.

Rather, claims 40, 55, and 88 recite that the switch (such as Q-switch 20) is closed for the appropriate period of time prior to each emission period regardless of the time interval between successive transmissions of pulses onto the workpiece. Claims 86 and 87 instead recite that the laser source is pumped continuously at constant power. These claim limitations distinguish the invention with respect to techniques described in the background section of the patent application.

New independent apparatus claims 94-97 are analogous to method claims 40, 55, 86, and 87 respectively. New independent method claim 98 is analogous to new apparatus claim 107 and new product-by-process claim 109.

Attached is a marked-up version of the changes being made by the current amendment.

Applicant asks that all claims be allowed. Enclosed is a $840 check for excess claim fees. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: October 16 2002

James E. Mrose
Reg. No. 33,264

Fish & Richardson P.C.
1425 K Street, N.W.
11th Floor
Washington, DC 20005-3500
Telephone: (202) 783-5070
Facsimile: (202) 783-2331

Version with markings to show changes made

In the detailed description:

Paragraph beginning at page 13, line 8 has been amended as follows:

The operator can choose a desired laser pulse width by computer control. The computer **11 (FIGS. 1 and 2)** is preprogrammed using a look-up table to provide the correct Q-switch storage time for the desired laser pulse width. The computer also provides the correct timing signal for the AOM deflector. Once the operator has chosen a desired pulse width, then the laser can be operated at any repetition rate below the maximum repetition rate that corresponds with this storage time, without change in the total energy per pulse or the pulse width. Thus, the energy delivered to the resistor, the pulse width, and the peak power are fixed at constant values over all repetition rates.

In the claims:

Claims 40, 55, and 86-87 have been amended as follows:

40. (Thrice amended) A method of operating a pulsed laser system [comprising:

providing a pulsed laser system] comprising a laser source and a switch configured to be closed to cause energy to be stored by the laser source for a desired period of time, and to be opened to allow energy to be emitted from the laser source during an emission period[;], **the method comprising:**

presetting**, through use of a processor,** a pre-selected pulse shape to be produced by the laser source, based on known properties of a target material to be processed on a workpiece;

selecting, **through use of a processor,** independently of the pre-selected pulse shape, a time interval between at least two successive transmissions of pulses onto the workpiece; and

pulsing the pulsed laser system**, through use of a processor,** by closing the switch for a fixed, predetermined period of time prior to each emission period regardless of the time interval between the at least two successive transmissions of pulses onto the workpiece, so as to cause the laser source to process the target material on the workpiece, with the selected time interval between the at least two successive transmissions of pulses onto the workpiece, while the pre-

selected pulse shape remains as preset regardless of the time interval, without selection of the time interval affecting the pulse shape.

55. (Thrice amended) A method of operating a pulsed laser system [comprising:

providing a pulsed laser system] comprising a laser source and a switch configured to be closed to cause energy to be stored by the laser source for a desired period of time, and to be opened to allow energy to be emitted from the laser source during an emission period[;], **the method comprising:**

presetting, **through use of a processor,** a pre-selected time interval between at least two successive transmissions of pulses onto a workpiece, based on known properties of a target material to be processed on the workpiece;

selecting, **through use of a processor,** independently of the pre-selected time interval, a pulse shape to be produced by the laser source; and

pulsing the pulsed laser system, **through use of a processor,** with the pulse shape selected independently of the pre-selected time interval, by closing the switch for a [fixed, predetermined] period of time prior to each emission period **that is fixed and predetermined for the selected pulse shape** regardless of the time interval between the at least two successive transmissions of pulses onto the workpiece, so as to cause the laser source to process the target material on the workpiece, while the pre-selected time interval remains as preset regardless of the pulse shape, without selection of the pulse shape affecting the time interval.

86. (Amended) A method of operating a pulsed laser system [comprising:

providing a pulsed laser system] comprising a laser source continuously pumped at constant power[;], **the method comprising:**

presetting, **through use of a processor,** a pre-selected pulse shape to be produced by the laser source, based on known properties of a target material to be processed on a workpiece;

selecting, **through use of a processor,** independently of the pre-selected pulse shape, a time interval between at least two successive transmissions of pulses onto the workpiece; and

pulsing the pulsed laser system, **through use of a processor, while the laser source is continuously pumped at constant power,** to cause the laser source to process the target

material on the workpiece, with the selected time interval between the at least two successive transmissions of pulses onto the workpiece, while the pre-selected pulse shape remains as preset regardless of the time interval, without selection of the time interval affecting the pulse shape.

87. (Amended) A method of operating a pulsed laser system [comprising:

providing a pulsed laser system] comprising a laser source continuously pumped at constant power[;], **the method comprising:**

presetting, **through use of a processor,** a pre-selected time interval between at least two successive transmissions of pulses onto a workpiece, based on known properties of a target material to be processed on the workpiece;

selecting, **through use of a processor,** independently of the pre-selected time interval, a pulse shape to be produced by the laser source; and

pulsing the pulsed laser system, **through use of a processor, while the laser source is continuously pumped at constant power,** with the pulse shape selected independently of the pre-selected time interval, to cause the laser source to process the target material on the workpiece, while the pre-selected time interval remains as preset regardless of the pulse shape, without selection of the pulse shape affecting the time interval. affecting the pulse energy characteristic.

88. (Amended) A method of operating a pulsed laser system [comprising:

providing a pulsed laser system] comprising a laser source and a switch configured to be closed to cause energy to be stored by the laser source for a desired period of time, and to be opened to allow energy to be emitted from the laser source during an emission period[;], **the method comprising:**

presetting, **through use of a processor,** a pre-selected pulse energy characteristic to be produced by the laser source, based on known properties of a trimmable component to be micro-machined on a workpiece;

dynamically selecting, **through use of a processor,** independently of the pre-selected pulse energy characteristic, during trimming of the trimmable component, a time interval between at least two successive transmissions of pulses onto the workpiece, so as to permit the

trimmable component to be measured accurately during trimming of the trimmable component; and

pulsing the pulsed laser system, **through use of a processor,** by closing the switch for a fixed, predetermined period of time prior to each emission period regardless of the time interval between the at least two successive transmissions of pulses onto the workpiece, so as to cause the laser source to micro-machine the trimmable component on the workpiece, with the selected time interval between the at least two successive transmissions of pulses onto the workpiece, while the pre-selected pulse energy characteristic remains as preset regardless of the time interval, without selection of the time interval affecting the pulse energy characteristic.